

REMARKS

Applicant received and reviewed the Office Action dated February 15, 2005 wherein the Office objected to the drawings as failing to comply with 37 CFR 1.84 (p)(5) because they include characters not mentioned in the description. The Office also objected to the disclosure due to typographical errors in the specification. Finally, the Office objected to claims 11, 14, and 20 because of informalities.

The Office rejected claims 6 and 20 under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 3-13 and 16 are rejected by the Office under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,136,681 (Takahashi). Additionally, claims 2, 14, and 17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Takahashi, U.S. Patent 5, 135,681 in view of Snow et al., U.S. Patent 5,039,193.

Objections

The Office objected to the drawings as failing to comply with 37 CFR 1.84 (p)(5) because they include characters not mentioned in the description. In response to the Office's instructions regarding the drawings, the applicant has enclosed 1 sheet of an amended drawing, a copy of which has been sent to the Office's Draftsperson with the request that the amended drawing be substituted for the corresponding drawing on file subject to the Examiner's approval. Specifically, 14' was changed to 14b' in Figure 3. This misnumbering does not require amendment of the specification.

Additionally, the Office objected to the disclosure due to typographical errors in the specification. Typographical errors in the specification per the Examiner's suggestion were amended, as shown in the version of amendments showing markings in the specification.

Finally, the Office objected to claims 11, 14 and 20 due to informalities. More specifically, the Examiner noted on page 3, lines 3-4:

“Regarding claim 11, line 3 there was a missing semicolon after the last word fiber. Also, in line 5, the word “terminus” should be added after the word “cut”.

The semicolon and word “terminus” were added to claim 11. These changes are reflected in the amended claims.

The Examiner also cited on page 3, lines 4-5:

“Regarding claim 14, line 1, there is a missing transition, such as “wherein” after the number 13.”

The Applicant amended the claim based on the Examiner's suggestion and the change is reflected in the amended claims.

Finally, on page 3, lines 6-7 of the Office Action:

“Regarding claim 20, line 2, there is missing text. Appropriate correction is required.”

The Applicant amended claim 20, line 2 to complete the claim. The following change is reflected in the version of claims showing markings:

“The method of claim 19 including the step of placing a rotational joint in another optical lead.” (Emphasis added.)

Rejection under 35 U.S.C §112

The Office rejected claims 6 and 20 under 35 U.S.C. §112. Specifically, the Examiner states on page 3, lines 13-15 of the Office Action:

“Claim 6 is rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.”

The Examiner also noted on page 3, lines 16-17 of the Office Action:

“Claim 6 recited the limitation “the rotatable member” in line 2. There is insufficient antecedent basis for this limitation in the claim.”

Thus, the Applicant amended the limitation “the rotatable member” in claim 6, line 2 to “a rotatable member”.

To support the 35 U.S.C. §112 rejection of claim 20, the Examiner states on page 3, lines 18-21 of the Office Action:

“Claim 20 is rejected under 35 U.S.C. §112, second paragraph, as being incomplete or omitting essential elements, such omission amounting to a gap between the elements. See MPEP 2172.01. These omitted elements are: where the rotational joint is placed since part of the text is missing.”

The Applicant amended claim 20, line 2 to complete the claim. The following change is reflected in the version of claims showing markings:

“The method of claim 19 including the step of placing a rotational joint in another optical lead.” (Emphasis added.)

Rejection under 35 U.S.C §103(a)

Claims 1, 3-13 and 16 are rejected by the Office under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,136,681 (Takahashi). It is submitted that the Office's rejection of claims 1, 3-13 and 16 under 35 U.S.C. §103(a) is in error.

It is submitted that the Applicant recognizes and solves a different problem than Takahashi. Specifically, the Applicant solves the problem of minimizing (1) power loss due to reflections and at the same time eliminates the (2) twisting of optical leads by a coupler that contains a rotational joint between ends of an optical fiber in the coupler. Takahashi, on the other hand, addresses the adjustment of the attenuation of the optical power between optical fiber 33 in a first coupler and optical fiber 34 in a second coupler. (Column 4 lines 45-50.) Takahashi does not mention the problem of twisting of optical leads and applicant has found no rotational joint between ends of an optical fiber in either coupler 31 or coupler 32 of Takahashi. Note, the Takahashi optical fibers 33 and 34 are coupled at the junction between his two couplers 31 and 32.

Considering claim 1, the Office asserts on page 4, lines 11-20:

“Regarding independent claim 1 as claimed, Takahashi teaches an optical coupler (Fig 3, ref sign 31) comprising a first optical fiber (Fig 3, ref sign 41b) and a further optical fiber (Fig 1, ref sign 41a) rotatably mounted with respect to the first optical fiber (col 5, lines 1-4) with an end of the first optical fiber (Fig 1, ref sign 41b-right end) positioned proximate an end of the further optical fiber (Fig 1, ref sign 41-left end) to permit transfer of an optical signal between the first optical fiber and the further optical fiber (col 4, lines 44-48) while permitting rotation thereof (col 5, lines 1-4).

It is noted that the Office refers to elements 41a and 41b as optical fibers when in fact Takahashi states that the 41a is “a small diameter cylinder” of ferrule 41 and that 41b is “a larger diameter

cylinder” of ferrule 41 (see column 4 lines 60-65). Applicant fails to find that 41a and 41b are optical fibers.

The office went on to state:

While the reference does not specifically show the first fiber end proximate the further fiber end, fibers are implied to be in the ferrules 41a and 41b to permit light transmission described above.”

It is noted that the Office first refers to elements 41a and 41b as optical fibers and now refers to 41a and 41b as ferrules. However, the two optical fibers of Takahashi are identified by numerals 33 and 34. (column 4 lines 47-48). Figure 3 shows that optical fiber 34 extends into ferrule 42 and optical fiber 33 extends into ferrule 41. Note, Takahashi defines elements 41a and 41b, in column 4, lines 60-61:

“First ferrule 41 consists of a small-diameter cylinder 41a, which can mate with alignment adapter 59, and a larger-diameter cylinder 41b which can mate with a holder 51, and a knob 41c.”

The Takahashi optical fibers 33 and 34 are joined at surfaces 35 and 36 (see Figure 3) While the ferrules of Takahashi surround the optical fibers 33 and 34 applicant has found no reference that indicates that the ferrule is also an optical fiber. In fact, Figure 5 shows an end view of coupler 31 that shows optical fiber 34 as distinct from ferrule 42 since it is centrally located within ferrule 42.

In contrast to Takahashi the applicant discloses an optical coupler with a first optical fiber and a further optical fiber rotatably mounted with respect to the first optical fiber. Reference page 5, lines 9-13 of the specification states:

“...the presence of the rotational coupler on at least one of the optical fibers allows one to rotate the optical lead without introducing kinks or twists and at the same time maintain

the integrity of the optical connection through the optical fibers while the angle cut face alignment coupler allows one to quickly couple or decouple the optical fiber while minimizing back reflections.”

It is important to differentiate “optical coupler” and “optical coupling”. The Applicant shows two optical couplers, reference numerals 10 and 30 in Figure 3. Reference page 8, lines 5-10:

“In the embodiment shown in Figure 3 a second identical optical coupler 30 is shown in cross section positioned proximate the opposite end of alignment sleeve 25. A first optical fiber 31 is rotationally coupled to a second optical fiber 32 through optical coupler 30, which is identical to optical coupler 10, to permit transmission of an optical signal from optical lead 31 to optical lead 32 through a butt coupled junction of optical faces 32b and 31a.” (Emphasis added.)

Note, Claim 1 points out that an optical signal is transferred in “an optical coupler” between the “first optical fiber” and “the further optical fiber” while permitting rotation thereof. A reference to Figure 4 of applicants drawing reveals “the first optical fiber” and “the further optical fiber” which are identified by reference numerals 11 and 17 and which are located in coupler 10.

While Takahashi teaches in Figure 3 two “optical connector plugs” (or couplers) reference numerals 31 and 32, applicant has not found any teaching of a junction of optical faces in the Takahashi coupler 31 or 32 much less a rotational optical joint in Takahashi couplers.

Based on the above, it is submitted that independent claim 1 is in condition for allowance. It follows that dependent claims 3-10 are also in condition for allowance.

Regarding independent claim 11, the Examiner states on page 5, lines 10-13 that:

“While the reference does not specifically show first and second fibers having an angle cut terminus, fibers are implied to be in ferrules 41a and 41b to permit light transmission described above and the ferrules (and thus fibers) have angle cut terminus’.”

The Office is in error in rejecting claim 11. Independent claim 11 calls for “a rotational joint on the first optical fiber and angle cut terminus on the end of the first optical connector and the second optical connector”. Thus, the optical signal is transferred across two interfaces while Takahashi transfers across only a single interface between optical leads. Furthermore, the Applicant does not find reference to a rotational joint on the optical coupler of Takahashi.

It is submitted that Takahashi fails to suggest the use of two optical junctions and therefore does not recognize the problem solved by the Applicant and thus independent claim 11 is in condition for allowance. It follows that dependent claims 12 and 13 are also in condition for allowance.

The Examiner also rejected method claim 16 is rejected under 35 U.S.C. §103(a) based on Takahashi. Specifically, the Examiner states on page 6, lines 1-5:

“While the reference does not specifically state or show a butt coupled joint in an optical lead or an angle cut face in an optical lead, fibers/optical leads are implied to be in ferrules 41a and 41b to permit light transmission described above and the ferrules (and thus fibers/leads) have angle cut faces and are butted up against each other ferrules/fibers.”

It is submitted that the Office is in error in characterizing an angle connector as a butt connector. Attention is called to page 2, line 21 – page 3, line 4 where the Applicant points out the butt connection and page 3, lines 6-20 where the Applicant points out the angle connection. The Applicant discloses the combination of butt-coupled joint in a coupler and a coupling angle cut face, which in combination minimizes (1) back reflection and (2) twisting of the optical lead.

Claims 2, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi, U.S. Patent 5,136,681 in view of Snow et al., U.S. Patent 5,039,193. The Examiner states on page 7, lines 15-16 of the Office Action that:

“Regarding claims 2 and 14, Takahashi teaches the limitations of claims 1, 11 and 16 as described above.”

And page 7, lines 17 – page 8, line 2:

“However, the reference is silent with respect to an optical conducting substance having an index of refraction matching an index of refraction of the first optical fiber/leads and the further optical fiber/lead located proximate the end of the first optical fiber and the end of the further optical fiber/lead or proximate the butt connectable end in the rotational joint or in the butt coupled joint. In other words, adding an index-matched fluid between the end of ferrules 41a and 41b.”

While it is submitted that the Office is in error in stating that Takahashi has an optical coupler as described in claim 1, it is also submitted that Takahashi and Snow do not teach an optical coupler with a rotational joint and coupling cut face producing one connection of optical fibers since each of them discuss only one type of coupling.

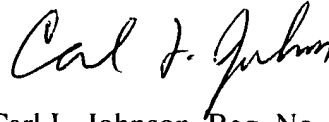
Therefore, it is submitted that claims 2, 14 and 17 are in condition for allowance.

In view of the above, it is submitted that claims 1-20 are allowable and a notice of allowance, as amended, is respectfully requested. Applicant has enclosed a marked-up version of the amendment with this response.

Respectfully submitted,

JACOBSON AND JOHNSON

By

A handwritten signature in cursive script, appearing to read "Carl L. Johnson".

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